

# Hidden treasures: Brazilian plants collected by Prince Maximilian zu Wied held in the National Herbarium of Victoria (MEL)

C.L. Gallagher<sup>1</sup> and P.L.R. de Moraes<sup>2</sup>

<sup>1</sup> National Herbarium of Victoria (MEL), Royal Botanic Gardens Melbourne, Private Bag 2000, South Yarra, Victoria 3141, Australia; e-mail: catherine.gallagher@rbg.vic.gov.au (corresponding author)

<sup>2</sup> Departamento de Botânica, Instituto de Biociências, Universidade Estadual Paulista "Júlio de Mesquita Filho", Av. 24 A 1515, Bela Vista, Caixa Postal 199, 13506-900 Rio Claro, SP, Brazil

## Abstract

The 'discovery' at MEL of some of the earliest extant herbarium specimens known from Brazil is detailed. The history and significance of 325 specimens collected by M.A.P. zu Wied in 1815–1817 is outlined and used to illustrate the value and relevance of the largely uncurated Sonder herbarium and wider foreign collection at MEL.

**Key words:** Sonder herbarium, Wied-Neuwied, Brazil

*Muelleria* 32:58–71 (2014)

## Introduction

Maximilian Alexander Philipp, Prinz zu Wied-Neuwied (1782–1867; zu Wied as of 1824 (Roth 2001)) was one of the first European naturalists to visit Brazil when he explored the south-eastern regions in 1815–1817. Wied was a major in the Prussian army but his passions were ethnology and the natural sciences (Moraes 2009). Whilst in Brazil, Wied made extensive field notes and observations on indigenous South Americans and gathered a wealth of ethnological, zoological and botanical specimens. Despite being relatively well known for his ethnological and zoological studies, Wied's contributions to botany have, until recently, received less attention. Recognition is long overdue: Wied's botanical specimens are amongst the earliest extant collections from Brazil and are a precious record of the Atlantic rainforest flora of Rio de Janeiro, Espírito Santo and Bahia (Moraes 2009).

Wied gathered an estimated 5000 specimens of 1000 plant species in Brazil (Kuhn 1991). After failing to attract a buyer for his complete herbarium in 1824 (Eichler 1869), he sold and donated the collection in numerous lots. Karl Friedrich Philipp von Martius purchased a set of 650 specimens in 1828 (Eichler 1869); this material is now part of Herbarium Martii at the National Botanic Garden of Belgium (BR; herbaria are henceforth referred to by *Index Herbariorum* codes (Thiers 2013)). Wied donated approximately 600 specimens to his former professor Heinrich Adolf Schrader in Göttingen (Martius 1837); this material is now held in GOET, LE and W. Other sets ended up with Christian Gottfried Daniel Nees von Esenbeck (now held at B, G, GZU, LE and STR (Moraes et al. 2013b)); Karl Sigismund Kunth (now at B, but partly destroyed during the Second World War; Hiepko 1987; Moraes 2011) and Otto Wilhelm Sonder (primarily at MEL, with small quantities at M and S). Wied also retained specimens in his own private herbarium (Herbarium Wied); this material was presumed



lost until it was rediscovered in the library of the Palace of Neuwied in 1998 (Moraes 2009). Other duplicates and fragments are widely scattered across herbaria including BAA, BM, C, CTES, E, F, FI, FR, JE, K, L, LD, M, MO, NY, OKLA, P, S, TO, U and US (Moraes et al. 2013b).

A comprehensive survey of the literature and herbaria by Moraes et al. (2013b) has located 2741 specimens collected by Wied, with these representing 1274 species. The present study is focussed on the material held at MEL. This material had been largely overlooked until Moraes contacted the Collections Manager in June 2008, originally in pursuit of Friedrich Sellow specimens. Moraes suspected that MEL might hold Wied specimens; a search of the Lauraceae confirmed this and thus began a five-year quest.

## Methods

This study was part of a larger project that involved combing the literature and searching for specimens at herbaria including B, BR, FR, G, GOET, GZU, LD, M, TO, W and Herbarium Wied.

Approximately 70 families at MEL were systematically scoured. Families that are well-represented in the flora of south-eastern Brazil were prioritised, as were those with a high proportion of mounted material. Specimens were verified based on the original labels and annotations, and comparison with material held in other herbaria; this process is discussed in further detail later.

The early part of the collaboration was conducted entirely by e-mail. Progress was initially relatively slow due to challenges with recognising Wied specimens and the time required to extract, database and photograph material, examine images and compile notes, transfer comments onto annotation slips and update database records. Work was greatly expedited when Moraes spent three weeks at MEL in July 2011. Even so, a major limiting factor in this study was the arduous process of searching for specimens: trawling through thousands of folders of unmounted material, painstakingly ensuring that the arrangement of folders was preserved so as not to corrupt the relationship between loose specimens and labels. Specimens were often filed under synonyms or in indeterminavit folders, thus precluding targeted searches.

Specimen details are listed in full by Moraes et al. (2013b) and are thus not repeated here. Specimen data

can be accessed via Australia's Virtual Herbarium (<http://avh.chah.org.au>). Images of the specimens will also eventually be available online via JSTOR Global Plants (<http://plants.jstor.org>).

## The Sonder herbarium

Wied's specimens came to MEL as part of the vast private herbarium of Otto Wilhelm Sonder (1812–1881). The Victorian government purchased the bulk of Sonder's herbarium in 1883, following a 24-year campaign by Government Botanist Ferdinand von Mueller (Short 1990).

A pharmacist and botanist, Sonder was extraordinarily energetic in his professional endeavours: he was the proprietor of a leading pharmaceutical establishment in Hamburg, a member of the medical board, an accomplished botanist and phycologist, and an avid collector and trader of botanical specimens (Short 1990). Mueller and Sonder established a correspondence sometime before 1858 (Home et al. 1998) and continued to exchange letters, books and specimens until Sonder's death in 1881. Unfortunately, few of their letters survive; much of Mueller's substantial archive of papers and correspondence disappeared, most likely disposed of when MEL was transferred to a new building in 1934–35 (Short 1990). Sonder's papers were destroyed in the aftermath of the Second World War (Home et al. 1998).

Regarded as 'the richest of all private botanical collections in existence' (Mueller 1859), the Sonder herbarium spans all major plant groups, algae and fungi. Mueller variously estimated it to comprise between 250,000 and 330,000 specimens (Mueller 1891, 1892). Such was the size of the collection, a new annexe had to be built at MEL to house it (Short 1990). The Sonder herbarium still accounts for the majority of MEL's estimated 400,000 foreign specimens. It includes important early 19th-century collections from tropical South America, Australia and southern Africa. Of particular note from South America are specimens cited in Martius' *Flora brasiliensis*, including material collected by F. Sellow, L. Riedel, A.F. Regnell, J.F. Widgren and Martius himself.

Mueller had a long-standing agreement with Sonder to purchase the herbarium for £1000 or ten instalments of £120 (Short 1990). Alas, aside from funding a single instalment (comprising three cases of specimens) in

1869, the Victorian government remained indifferent to Mueller's repeated propositions (Short 1990). Mueller persisted, and in 1882 finally triumphed in securing £900 for the balance of the Sonder herbarium. In the meantime, however, N.J. Andersson had approached Sonder seeking to purchase the collection for the Swedish Museum of Natural History (S; Nordenstam 1980). Fortunately for Mueller, Andersson was unable to raise the capital for the entire collection, and instead secured only Sonder's prized South African collection (Nordenstam 1980). Intriguingly, the Sonder collection at MEL is rich in South African specimens, suggesting that Sonder may not have been wholly truthful in his assurances to Andersson that the collection was fully intact (Nordenstam 1980). As noted by Nordenstam (1980), Sonder may well have separated duplicates and fragments for Mueller and/or himself when he sorted through his South African herbarium before shipping it to S in 1875. An alternative explanation, as suggested by Short (1990), is that much of the South African material at MEL derives from the three cases of specimens that arrived in 1869. Closer investigation may resolve this mystery.

Mueller took delivery of 38 cases of Sonder material on 13 November 1883 (Mueller 1883). The collection arrived without an accompanying inventory and is yet to be fully documented. Soon after receiving the material, Mueller flagged his intention to prepare 'a fuller account of the contents of this large collection' (Mueller 1883). Alas, no such record has been located. The only published accounts of the Sonder collection are very general (Court 1972), concerned primarily with the history of its acquisition (Short 1990), or limited to a particular taxonomic group (e.g. Anderson 1971). Efforts to survey and document the collection are hindered by the sheer volume of material and the relatively inaccessible state of the specimens: less than 15 per cent are mounted and databased. Most of the material is still stored much as it was when it arrived at MEL 130 years ago: in bundles of intricately interleaved paper folders containing loose specimens with loose labels. This lack of documentation and poor accessibility mean that MEL's foreign collection is not well known within the international botanical community.

## The Wied collection at MEL

Little is known as to how and when Sonder acquired Wied's specimens. Wied began distributing material to botanists such as Schrader, Nees and Martius soon after he returned from Brazil in 1817. It is possible, but unlikely, that Sonder received specimens directly from Wied. As noted by Eichler (1869), Wied first offered his collection for sale in 1824, at which time Sonder was just 12 years old. Specimens at BR indicate that Wied continued to send material to Martius until 1839. However, Sonder did not establish his pharmacy until 1841 (Stafleu & Cowan 1985) and is thus unlikely to have had the means to acquire collections such as Wied's before then. More plausible is that Sonder obtained the Wied specimens through other channels at a later date. Sonder became very well-connected in the commercial trade of botanical specimens: as well as purchasing collections for himself, he acted as an agent to procure specimens on behalf of others (Nordenstam 1980). He also regularly loaned and exchanged material with a wide range of prominent botanists (Nordenstam 1980). Given that Berg (1857) cited Wied specimens as 'Herb. Sonder' in his account of the Myrtaceae in the *Flora brasiliensis*, Sonder evidently obtained at least some of the Wied material well before 1857.

A search of more than 70 families at MEL has so far yielded 325 Wied specimens, spanning 150 genera and 259 species of vascular plants. Of particular note are 145 type specimens, including several unicates, e.g.:

- MEL 2353741 – Holotype of *Stenocalyx sulcatus* var. *strictus* O.Berg, *Fl. Bras.* 14(1): 339 (1857) = *Eugenia sulcata* var. *stricta* (O.Berg) Mattos (Myrtaceae; fig. 1).

Also of note are duplicates of specimens that were destroyed by fire when the Botanical Museum in Berlin (B) was bombed by the allied forces on the night of March 1–2, 1943 (Hiepmo 1987), e.g.:

- MEL 2062015 – Lectotype of *Zollernia falcata* Wied-Neuw. & Nees = *Z. glabra* (Spreng.) Yakovlev (Fabaceae)
- MEL 289020 – Isolectotype of *Zollernia splendens* Wied-Neuw. & Nees (Fabaceae)
- MEL 2353844 and MEL 2353845 – Syntypes of *Evolvulus maximilianii* Mart. ex Choisy (Convolvulaceae)
- MEL 2353782 – *Anthurium intermedium* Kunth (Araceae)

At least one specimen represents a new record: *Neomarica humilis* (Klatt) Capell. has not previously been recorded from Bahia (Capellari Jr. 2000; Gil 2012). Two specimens located at MEL are the first (and possibly only) verifiable record of this species from Bahia, and are thus a compelling example of the importance and enduring value of Wied's collections:

- MEL 2355228 – Holotype of *Cypella humilis* Klatt, *Linnaea* 31: 540 (1862) = *Neomarica humilis* (Klatt) Capell. (Iridaceae; fig. 2)
- MEL 2355229 – Isotype of *Cypella humilis* Klatt = *Neomarica humilis* (Klatt) Capell. (Iridaceae)

These specimens also present an interesting nomenclatural case. The original label on MEL 2355228 is annotated by Nees with 'Moraea Northiana v.  $\beta$  breviscapa N. ab E. Nees and Martius (Wied-Neuwied 1823) somewhat ambiguously describe 'Moraea northiana var. scapo foliis brevior, spathe unifloris' and propose the name *Moraea breviscapa* should the taxon be deemed a species in its own right. However, under article 36.1 of the *International Code of Nomenclature for algae, fungi, and plants* (McNeill et al. 2012), this does not constitute valid publication of the name *Moraea breviscapa*. Klatt's (1862) subsequent publication of *Cypella humilis* Klatt is thus valid.

The specimens at MEL are richly documented with Wied's original labels. Paradoxically, recognising Wied specimens was a challenge in the early stages of the study. Wied's labels tend to be either scrawled in pencil or (relatively) neatly penned in ink. The former vary in format, detail and legibility (at least to the uninitiated; figs. 8b–d and f). The latter are more distinctive (and legible) and typically include more detail (figs. 8a and j). Aside from Wied's own labels, there is a remarkable array of other labels and annotations, including specimens labelled by Sonder (fig. 8g) and/or annotated by Martius (figs. 8e and h), Berg (fig. 8a), Nees (fig. 8b), Klatt (fig. 8b), Koernicke (fig. 8g) and others.

Wied is not explicitly designated as the collector on almost two thirds of the sheets at MEL; these specimens can only be recognised based on the handwriting, localities, and/or annotations by botanists such as Berg and Martius. Where Wied is indicated on the label, he is variously denoted as Neovid., Neowied., Neuwied, Princ. Neovidensis, Prinz Max. v. Neuwied and

variations thereof. Wied numbered a small proportion of specimens himself, but for some reason, most of these numbers have been crossed out. Several specimens have been numbered by Schrader (fig. 7) and Nees.

The collecting locality is specified on approximately half of the specimens at MEL, but is sometimes heavily abbreviated (e.g. Str.d.C.F.B. = Straße des Colonel Felisberto Brant, a road linking Ilhéus with Minas Gerais. Wied travelled from 'S. Pedro Alcantara' (Itabuna) to 'Barra da Vareda' (Inhobim) (Wied-Neuwied 1821)). Although Wied's itineraries have been well-documented by Wied himself (Wied-Neuwied 1820, 1821) and others (e.g. Urban 1906; Bokermann 1957), there are occasionally discrepancies between the localities and dates recorded on the labels and those documented in Wied's own itineraries (Moraes et al. 2013b). Certain localities can be regarded as exclusive toponyms, in that they were not visited by any other European collectors in the early 19th century (e.g. 'Aldea Velha', 'Barra de Jucu', 'Campos Novos', 'Itapemirim', 'Moribeca', 'Mucuri', 'Rio Belmonte', 'Rio Doce' and 'Tamburil and Valo'; Moraes et al. 2013a).

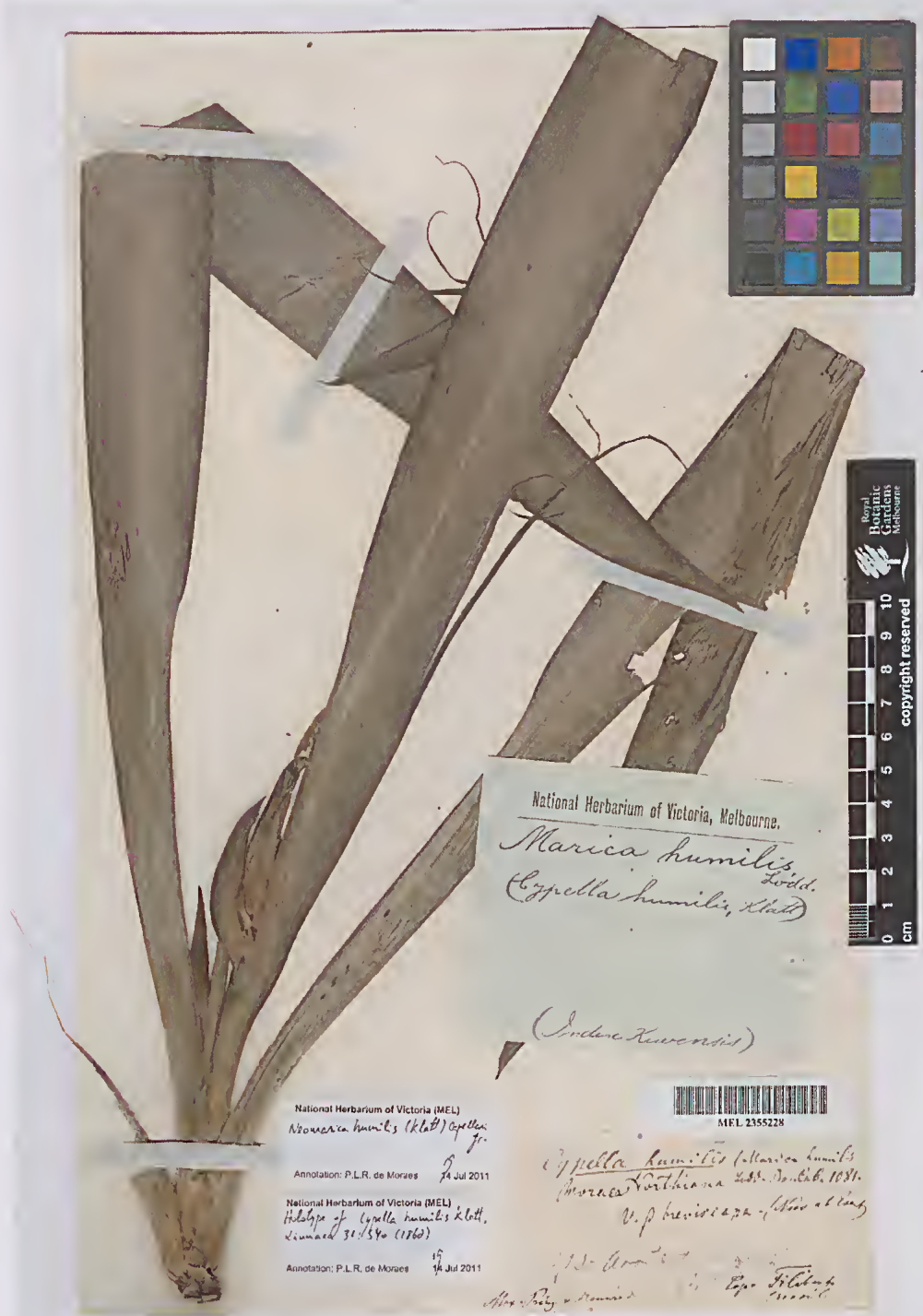
Online resources such as JSTOR Global Plants were invaluable for accessing images of specimens held in other herbaria. However, the value of such resources was only fully realised when images were accompanied by a transcribed and translated record of the label information. Unfortunately, only a small minority of records include this level of detail. There is enormous scope for online resources to become a powerful tool to aid curators to recognise handwriting, decipher and translate labels, interpret localities and georeference specimens.

Despite encompassing just over half of the total number of families collected by Wied, this study indicates that the material at MEL represents the second most comprehensive set of Wied specimens, eclipsed only by the Herbarium Martii at BR. This is nicely exemplified in both the Myrtaceae and Eriocaulaceae. In his account of the Myrtaceae for the *Flora brasiliensis*, Berg (1857) cited Wied specimens for 31 species; 23 have so far been found at MEL, 18 of which are nomenclatural types. Only three of these have been recognised previously (Anderson 1971). In the Eriocaulaceae, Koernicke (1863) cited 20 Wied specimens in the *Flora brasiliensis*; 18 have been located at MEL and all but one are known only from MEL.



NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

**Figure 1.** MEL 2353741 – Holotype of *Stenocalyx sulcatus* var. *strictus* O.Berg. [Rio de Janeiro, M.A.P. zu Wied s.n.], Sept. 1815. See fig. 8a for label detail and transcription. All images reproduced with permission from the National Herbarium of Victoria (MEL), Royal Botanic Gardens Melbourne.



National Herbarium of Victoria, Melbourne.  
*Marica humilis* Lodd.  
*(Cypella humilis Klatt)*

(*Indica Kewensis*)

National Herbarium of Victoria (MEL)  
*Nonseria humilis (Klatt) Cypella* fr.  
 Annotation: P.L.R. de Moraes 24 Jul 2011

National Herbarium of Victoria (MEL)  
 Holotype of *Cypella humilis* Klatt.  
 Linnæus 31/34a (1762)  
 Annotation: P.L.R. de Moraes 24 Jul 2011

MEL 2355228

*Cypella humilis* (Linnæus) Klatt  
*(Moraea Kewensis Lodd. Bot. Cab. 1831)*  
*V. p. brevicauda - Linnæus at long*

*Wied. Ann. Bot. Soc. Lond. 1831*  
*Wied. Bot. Soc. Lond. 1831*

NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

Figure 2. MEL 2355228 – Holotype of *Cypella humilis* Klatt. [Bahia:] Capó da Filisberto [via Felisbertia], M.A.P. zu Wied s.n., s.d. See fig. 8b for label detail and transcription.



**Figure 3.** MEL 2331220 – *Cocoloba arborescens* (Vell.) R.A.Howard (Polygonaceae). [Rio de Janeiro: between] St. Juan [= San João] – Rio dos Oistres [= Rio dos Ostras, M.A.P.zu Wied s.n., Sep 1815]. See fig. 8c for label detail and transcription.



MEL 2341135

*Alsodeia physiphora* Mart.  
 = *Rinorea laevigata* (Sol. ex Ging.) Hekking  
 Campos Novos [= Tamoios] et Rio Jo. [= Rio de Janeiro, M.A.P. zu Wied s.n., Sep. 1815].  
*Alsodeia physiphora* Hekking

NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

**Figure 4.** MEL 2341135 – *Alsodeia physiphora* Mart. = *Rinorea laevigata* (Sol. ex Ging.) Hekking (Violaceae). [Rio de Janeiro: Fazenda de] Campos Novos [= Tamoios] et Rio Jo. [= Rio de Janeiro, M.A.P. zu Wied s.n., Sep. 1815]. See fig. 8d for label detail and transcription.





NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

**Figure 5.** MEL 2353803 – *Adenocalymma trifoliatum* (Vell.) R.C.Laroche (Bignoniaceae). [Bahia:] Str d Capt. Filisbert. [= Straße des Capitam Filisberto Gomes da Silva, M.A.P. zu Wied s.n., Jan 1817]. See figs. 8e–f for label detail and transcription.



*Paepalanthus fluitans*  
*Leiothrix fluitans*  
 Brasilien.  
 S. P. Wiedemann



National Herbarium of Victoria (MEL)  
 Syntype of *Paepalanthus fluitans* Mart.  
 ex Körn. Pl. Bras. III: 415, t. 33, fig. 1  
 (1831) = *Leiothrix fluitans* (Mart.) Ruhland  
 Determinavit: P. L. J. de Moraes 19 Jul 2011



NATIONAL HERBARIUM OF  
 VICTORIA (MEL), AUSTRALIA

**Figure 6.** MEL 2353747 – Syntype of *Paepalanthus fluitans* Mart. ex Körn. = *Leiothrix fluitans* (Mart. ex Körn.) Ruhland (Eriocaulaceae). Brazil. M.A.P. zu Wied s.n., s.d. See fig. 8g for label detail and transcription.



NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

**Figure 7.** MEL 2353799 – *Pyrostegia venusta* (Ker Gawl.) Miers (Bignoniaceae). [Bahia:] R.B. [= Rio Belmonte, M.A.P. zu Wied s.n., 1816]. See figs. 8h–j for label detail and transcription.



**Figure 8.** Label detail. **a.** MEL 2353741. Scripsit Wied: "19./ Eugenia/ Sept. 1815/ Buschbaum van 10–12 f. [= shrubby tree of 10–12 ft]"; Scripsit Berg: "Stenocalyx sulcatus  $\gamma$  strictus Bg./ Martius"; **b.** MEL 2355228. Scripsit Wied (in pencil): "Ist der [...] / Str[a]be d[es] Capt. Filisbert"; Scripsit Nees: "Moraea Northiana v.  $\beta$  brevicaapa"; Scripsit Klatt: "Cypella humilis (Marica humilis Ladd., Bot. Cab. 1081)"; Scripsit Sander: "(Nees ab Esenb.)/ Max. Prinz. v. Neuwied/ Capa Fili[s]berta/ Brasil"; **c.** MEL 2331220. Scripsit Wied: "Pentandr[ia] monogynia/ zwisch[en] St. Juan – Ria dos Oistres/ Bl[ume] weißgelblich [= flower whitish-yellow]"; **d.** MEL 2341135. Scripsit Wied: "Alsodeia – Violaceae/ Pentand[ria] managyn[ia]/ Campas novas et Rio Jo./ Capsula tricacca/ A. physiphara Mart. [...]"; **e.** MEL 2353803. Scripsit Martius: "Adenocalymna longiracemasum  $\beta$  trichacladum"; **f.** MEL 2353803. Scripsit Wied: "Bignonia/ Str[a]be d[es] Capt. Filisbert"; **g.** MEL 2353747. Scripsit Sander: "Brasilia/ Pr. M. v. Neuwied". Scripsit Koernicke: "Paepalanthus (Lophophyllum) fluitans Mart."; **h.** MEL 2353799. Scripsit Martius: "Bignonia venusta Ker/ videtur/ DC. n. 88"; **i.** MEL 2353799. Scripsit Wied: "Schraden Bignon./ No. VI +"; **j.** MEL 2353799. Scripsit Wied: "Schlingende Pfl./ mit hoch Orangen/ farbigere Blumen/ R.B. [= twining plant with highly orange colored flowers/ Rio Belmante]".

All of the specimens found so far at MEL are vascular plants. Wied is known to have collected cryptogams, but these specimens are poorly documented in both the literature and herbaria. The Sonder herbarium is rich in cryptogamic material; if any of Wied's cryptogamic specimens have survived, they are quite possibly at MEL. However, partial searches of the bryophyte, lichen and Rhodophyta collections have so far failed to yield any specimens.

Based on the findings to date, MEL is likely to hold Wied specimens of a further 100 species.

## Conclusion

This study has delivered several noteworthy outcomes. First and foremost, the Wied specimens unearthed at MEL are fully accessible to researchers for the first time in almost 200 years. These specimens are a precious record of the Atlantic rainforest flora of south-eastern Brazil in the early 19th century. Far from being a mere historical curiosity, this material is directly relevant to current research and conservation efforts. In particular, the high proportion of types means that the Wied collection at MEL is essential to taxonomic studies of the Brazilian flora.

Secondly, the curated specimens will facilitate the recognition of further Wied material, both at MEL and elsewhere. Because the MEL specimens are so well-documented with original labels, they are an invaluable reference to aid curators to recognise and decipher Wied's labels. Many of the specimens held in other herbaria bear labels and/or annotations from Martius, Schrader, Nees, Wilhelm Klenze (Klaenze) and Karl Theodor Mencke (Menke), and have been wrongly attributed to these botanists in both the literature and herbarium databases. Already, MEL material has been instrumental in disentangling such misinterpretations (e.g. Moraes et al. 2013a, 2013b).

Thirdly, this study highlights the value of international collaboration in curating historical collections. More specifically, this investigation demonstrates the benefits of engaging a knowledgeable external botanist or curator to survey and assess specimens in partnership with the custodian collection's staff. In this respect, this study could serve as a model for future projects targeting specific components of MEL's foreign collection. Such projects would essentially function as reconnaissance

missions to identify significant but cryptic specimens and equip collections staff with the knowledge and resources necessary to curate specimens accurately and efficiently.

Finally, this study is a small step towards uncovering and documenting the hidden riches of the Sonder collection at MEL. Perhaps more than anything, it provides a tantalising promise of other significant, but as yet undiscovered, material.

## Acknowledgements

P.L.R. de Moraes is grateful for the FUNDUNESP grant (Proc. Nr. 00073/11-DFP) that supported his visit to MEL, sponsorship from the CAPES/DAAD Agreement in 2008 for a visit to BR and grants from CNPq (PQ2 and Proc. Nr. 450515/2013-3 for a visit to LE). C. Gallagher thanks the Friends of the Royal Botanic Gardens Melbourne Inc. for providing scholarship funds to attend the 2013 DEST Botanical Nomenclature training course at the Royal Botanic Gardens, Kew, and Pina Milne (MEL Collections Manager) for her encouragement and support. The authors are also indebted to Tom May, Juergen Kellermann and an anonymous referee for their helpful comments and suggestions on the manuscript.

## References

- Anderson, J.A. (1971). Otto Carl Berg's types of Myrtaceae in the National Herbarium of Victoria. *Muelleria* **2**(2), 119–131.
- Berg, O.C. (1857). 'Myrtaceae', Pars prima (trib. Myrteae), in K.F.P. von Martius (ed.), *Flora brasiliensis* **14**(1), 1–468, t. 1–35. Typographia Regia: Munich.
- Bakermann, W.C.A. (1957). Atualização do itinerária da viagem da Príncipe de Wied aa Brasil (1815–1817). *Arquivos de Zoologia do Estado de São Paulo* **10**, 209–251.
- Capellari Jr., L. (2000). *Revisão taxanômica da gênera Neomarica Sprague (Tribo Mariceae, Subfamília Iridoideae, Iridoceae)*. D.Sc. thesis, Universidade Estadual de Campinas, Campinas.
- Court, A.B. (1972). Preliminary notice on the Sonder collection in the National Herbarium of Victoria. *Muelleria* **2**(3), 188.
- Eichler, A.W. (1869). *Das Herbarium Martii*. Kgl. Hofbuchdruckerei van Dr C. Wolf & Sohn: Munich.
- Gil, A.S.B. (2012). *Revisão taxanômica e estudos filogenéticos da gênera Neomarica s.l. (Iridoceae)*. D.Sc. thesis, Universidade Estadual de Campinas, Campinas.
- Hiepka, P. (1987). The collections of the Botanical Museum Berlin-Dahlem (B) and their history. *Englera* **7**, 219–252. Available at <http://www.bgbm.org/bgbm/research/colls/herb/hist2.htm>
- Home, R.W., Lucas, A.M., Maraske, S., Sinkora, D.M. and Voigt, J.H. (eds) (1998). *Regardfully yours: selected correspondence of Ferdinand von Mueller, vol. 1: 1840–1859*. Peter Lang: Bern.

- Klatt, F.W. (1862). Specimen e familia Iridearum. *Linnaea* **31**, 533–570.
- Koernicke, F. (1863). 'Eriocaulaceae', in K.F.P. von Martius and A.W. Eichler (eds.) *Flora brasiliensis* **3(1)**, 273–508. Typographia Regia: Munich.
- Kuhn, D. (1991). 'Einführung', in *Brasilien-Bibliothek der Robert Bosch GmbH: Katalog. Bd. 2. Nachlaß des Prinzen Maximilian zu Wied-Neuwied / Teil 2: Briefwechsel und Zeichnungen zu den naturhistorischen Werken*, pp. 9–21. Deutsche Verlags-Anstalt GmbH: Stuttgart.
- Martius, K.F.P. von (1837). *Herbarium Florae brasiliensis* (Einleitung; I. Zur Literärgeschichte der Flora brasiliensis). *Flora* **20(2, Beibl.)**, 1–49.
- McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J., Prud'homme van Reine, W.F., Smith, G.F., Wiersema, J.H. and Turland, N.J. (2012). *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code)*. Regnum Vegetabile 154. Koeltz Scientific Books: Berlin. Available at <http://www.iapt-taxon.org/nomen/main.php>
- Moraes P.L.R. de. (2009). The Brazilian herbarium of Maximilian, Prince of Wied. *Neodiversity* **4**, 16–51. Available at <http://www.neodiversity.org/articles/neod4201.pdf>
- Moraes P.L.R. de. (2011). Notes and lectotypification of names based on Brazilian collections of Prince Maximilian of Wied. *Kew Bulletin* **66**, 493–503.
- Moraes, P.L.R. de, Smedt, S. de, Esser, H.-J., Gallagher, C. and Guglielmone, L. (2013a). On some Brazilian plants distributed by Martius in 1827 and published by Colla in 1833. *Harvard Papers in Botany* **18(1)**, 23–36.
- Moraes, P.L.R. de, Robbrecht, E., Smedt, S. de, Dressler, S., Heinrichs, J., Reiner-Drehwald, M.H., Drescher, A., Scharfetter, A., Frödén, P., Esser, H.-J., Gallagher, C., Guglielmone, L. and Rainer, H. (2013b). Catalogue of Brazilian plants collected by Prince Maximilian of Wied. *Scripta Botanica Belgica* **49**, 1–249.
- Mueller, F.J.H. (1859). Unpublished memorandum to the Chief Secretary's office, dated 1 November 1859. PROV, VPRS 1189, box 747.
- Mueller, F.J.H. (1883). Unpublished memorandum to the Chief Secretary's office, dated 14 November 1883. PROV, VPRS 3991, box 1418.
- Mueller, F.J.H. (1891). Unpublished letter to H.G.A. Engler, dated 14 December 1891. Staatsbibliothek, Preussischer Kulturbesitz, Berlin.
- Mueller, F.J.H. (1892). Unpublished letter to J.G. Agardh, dated 8 August 1892. Univ. Library, Lund.
- Nordenstam, B. (1980). The herbaria of Lehmann and Sonder in Stockholm, with special reference to the Ecklon and Zeyher collection. *Toxon* **29**, 279–288.
- Roth, H.J. (2001). Maximilian Prinz zu Wied (1782–1867). Zum Nachdruck seiner "Reise nach Brasilien" anlässlich der 500-Jahrfeier des Landes. *Jahrbücher des Nossauischen Vereins für Naturkunde* **122**, 139–147.
- Short, P.S. (1990). 'Politics and the purchase of private herbaria by the National Herbarium of Victoria', in Short, P.S. (ed.), *History of Systematic Botany in Australasia*. Australian Systematic Botany Society: Melbourne.
- Stafleu, F.A. and Cowan, R.S. (1985). *Taxonomic Literature: a selective guide to botanical publications and collections with dates, commentaries and types*, vol. 5. Bohn, Scheltema & Holkema: Utrecht.
- Thiers, B. (2013). *Index Herbariorum: a global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available at <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>
- Urban, I. (1906). 'Vitae itineraque collectorum botanicorum', in K.F.P. von Martius, A.W. Eichler and I. Urban (eds.), *Flora brasiliensis* **1(1)**, 1–154. Typographia Regia: Munich.
- Wied-Neuwied M.A.P. zu. (1820). *Reise nach Brasilien in den Jahren 1815 bis 1817. Erster Bond*. (Quarto edition). Heinrich Ludwig Brönnner: Frankfurt am Main.
- Wied-Neuwied M.A.P. zu. (1821). *Reise nach Brasilien in den Jahren 1815 bis 1817. Zweyter Bond*. (Quarto edition). Heinrich Ludwig Brönnner: Frankfurt am Main.
- Wied-Neuwied, M.A.P. zu. (1823). Beitrag zur Flora Brasiliens. *Novo Acto Physico-Medico Academiae Caesoreae Leopoldino-Carolineae Naturae Curiosorum* **11**, 1–88.